

Wild Hogs

James G. Dickson¹

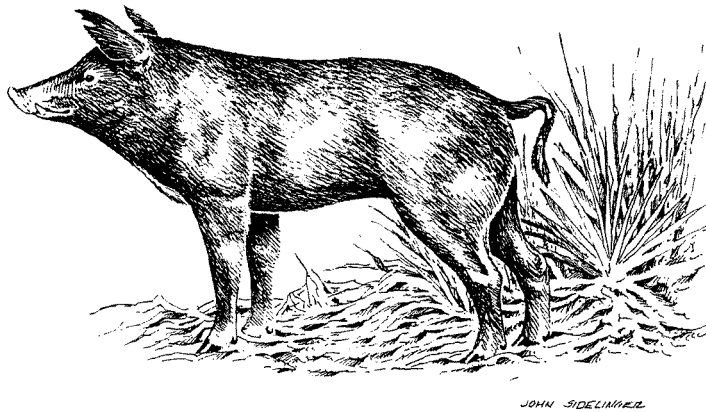
*US Forest Service
Southern Research Station,
Nacogdoches, TX*

John J. Mayer

*Westinghouse
Savannah River Company,
Aiken, SC*

John D. Dickson²

*Texas Wings
Austin, TX*



Wild hogs or swine are medium to large-sized, stout-bodied, and proportionately short-legged hoofed mammals with thick skin covered with sparse to dense coats of coarse bristles. These animals have elongated

heads and snouts ending in a disc-like pad through which the external nares open. The only other species in the southern United States that resembles the wild hog is the collared peccary or javelina, found in Texas, New Mexico and Arizona.

Two primary types of wild hogs, Eurasian wild boar and feral swine (wild hogs solely of domestic ancestry), have been established in the southern United States. These 2 types are conspecifics and will readily hybridize (Wood and Barrett 1979, Mayer and Brisbin 1991). At present, there are only populations of feral swine and wild boar x feral swine hybrids found in the South. No pure populations of Eurasian wild boar are known or have been documented to exist in this region

of the country at present (Mayer and Brisbin 1991). In this chapter, these different types of wild hogs will be treated together unless otherwise noted.

Feral hogs resemble domestic hogs, but usual-

ly are leaner, and generations in the wild have honed adaptations for life in the wild. Eurasian wild boar, also known as European wild hogs or Russian boars, are about the same size as feral hogs, but have a grizzled, sleeker appearance, with light tipped hair, and longer legs and snout. Specifically, there are both physical and molecular differences among the 3 types of wild hogs. Of these, the morphological differences are the most useful in differentiation. Variation in coloration patterns, cranial differences, and snout and hind foot length have been used to tell the different types of wild hogs apart with a far degree of accuracy. In addition, mitochondrial DNA techniques are beginning to show promise in identifications (Mayer and Brisbin 1993). In contrast to

¹Current Address: School of Forestry, Louisiana Tech University, Ruston, LA

²Current Address: Texas Parks and Wildlife, Austin, TX



Recently, wild hogs have become a more prominent part of the southern landscape (*J. Mayer*).

earlier beliefs, the presence of striped coloration patterns in piglets is not a reliable character for identifying either Eurasian wild boar or hybrids (Mayer and Brisbin 1993).

In general, male wild hogs are somewhat larger than females. This size relationship is true for both external physical dimensions and total body mass. These differences are initially evident at about 15 months of age, and increase with age. Average adult males are about 5 feet from the snout to the end of the tail, stand 3 feet at the shoulder, and weigh between 180 and 200 pounds. Exceptional animals can weigh in excess of 500 pounds. Wild hogs have an excellent sense of smell and fair to good senses of hearing and vision. Tusks or canine teeth in males are much larger than in females (Mayer and Brisbin 1988), and have trophy value to some hunters.

In many areas of the southern United States, wild hogs are considered to be an important recreational resource as a big game animal (Mayer and Brisbin 1991), with recreational sport hunting having substantial economic impact. In Florida alone, this has annually represented a multi-million dollar industry (Degner 1989). Particularly in Florida, North Carolina, Tennessee, and

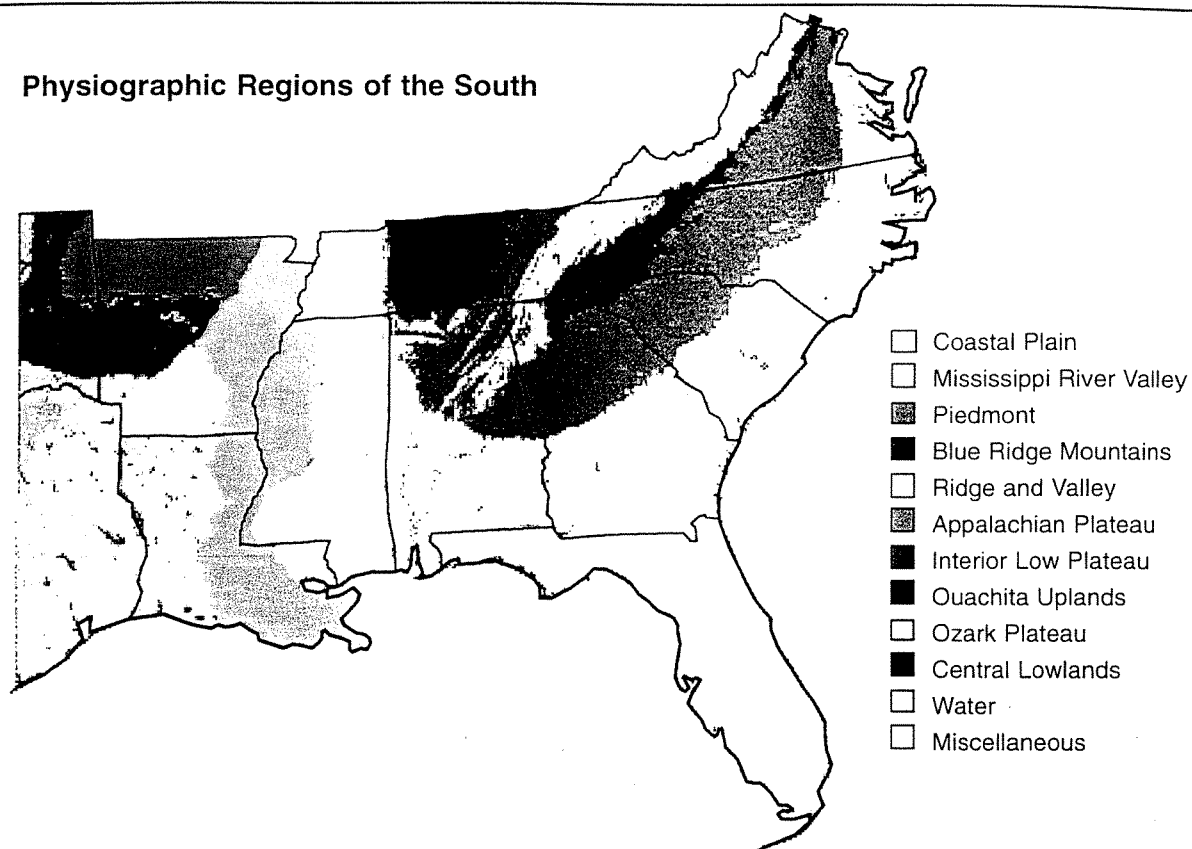
Texas, the opportunity to hunt wild hogs has attracted large numbers of nonresident hunters and has an economic impact (Conley et al. 1972, Degner 1989).

HISTORY

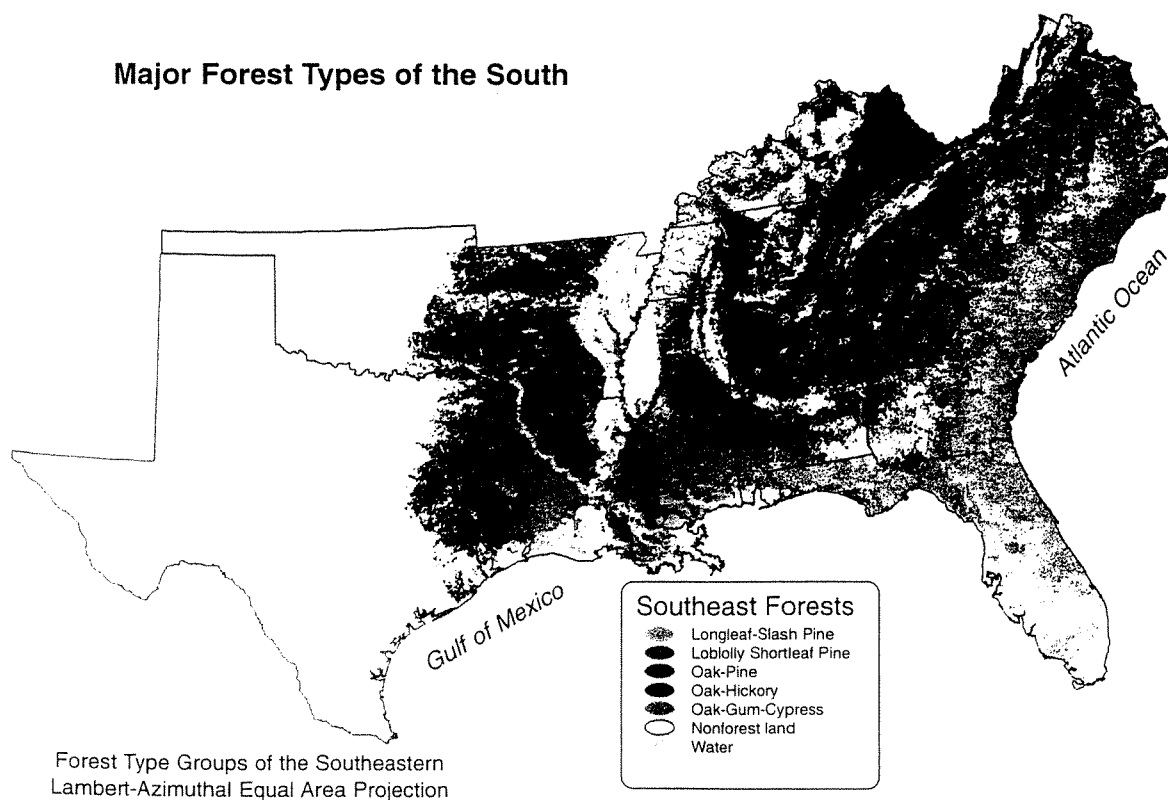
Being a non-native or exotic species, the origin of wild hogs in the western hemisphere is attributable solely to either the intentional or accidental release of these animals by man. The earliest presence of this species in the southern United States can be traced back to the introduction of domestic swine into Florida by Hernando De Soto in 1539. Along De Soto's route through 13 states, domestic swine escaped into the wild. Subsequent Spanish and French colonies in the South introduced more domestic swine. By the 1700s, feral populations of swine were established throughout the region (Towne and Wentworth 1950, Mayer and Brisbin 1991).

In addition to these early introductions, colonial settlers in the South released domestic swine into unfenced woods to fend for themselves, foraging on mast and other foods. Whenever the settlers wanted pork, the animals were either caught with dogs, trapped, or shot.

Physiographic Regions of the South



Major Forest Types of the South



Forest Type Groups of the Southeastern
Lambert-Azimuthal Equal Area Projection



Top: Forests of the South have always been diverse as well as dynamic (*G. Smith*).

Left: Southern forests have been continually molded by a variety of diverse natural and anthropogenic forces (*J. Walker*).

Above: In the era of exploitation in the late 1800s and early 1900s a few species, such as this ivory-billed woodpecker, apparently were eliminated from southern forests (*G. Sutton, Cornell Lab of Ornithology*).

A number of species whose future once was in doubt have been successfully restored to southern forests.



The black bear—With pressure from humans it was once found only in remote swamps and mountains. Now populations are expanding where there is extensive habitat in the Appalachian and Ozark mountains (*D. Hancock*).

The white-tailed deer, a premier game species. Populations were once decimated by the new southern settlers and relegated to a few locations. Now it thrives throughout the South and is found in every county (*B. Lea*).



The bald eagle, is now making a remarkable recovery nationwide (*L. P. Brown, Cornell Lab of Ornithology*).



The gobble of the wild turkey once again resounds throughout the South. What a tremendous conservation success story. Where once there were mere 10s of thousands now there are over 2 million southwide (*G. Smith*).

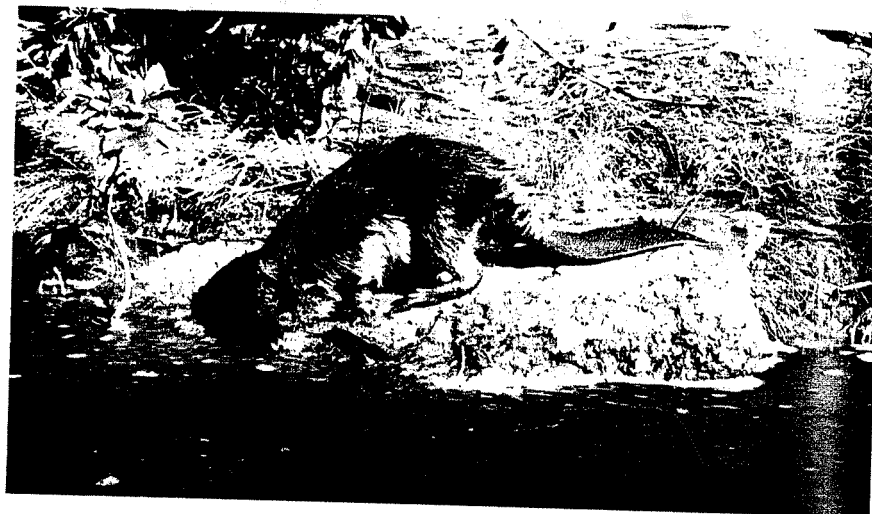


The wood duck—What a beautiful creature and appropriately named. It has returned to prominence in southern forested wetlands. It is the only species of waterfowl that nests in cavities throughout the South (*J. Dickson*).

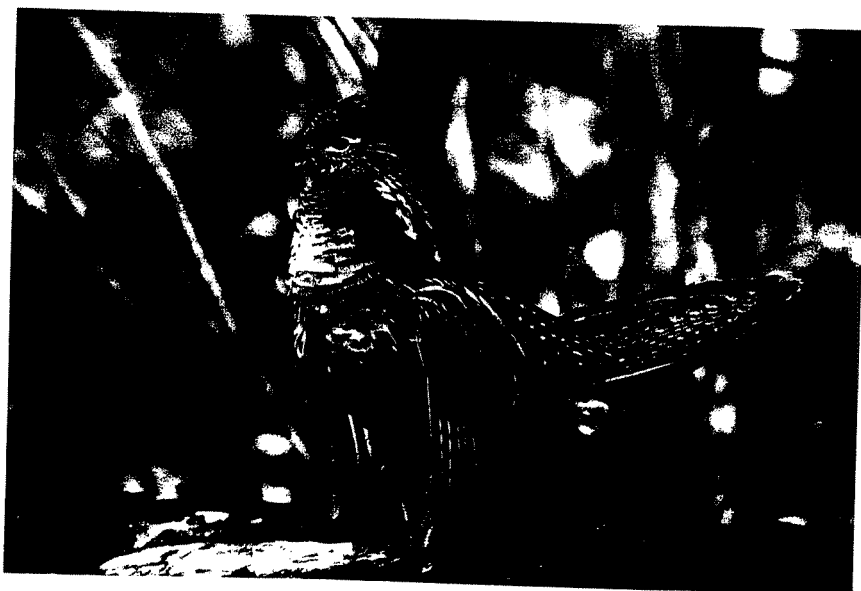
Man and wildlife continue to interact in many different ways.



Mourning doves may have declined from the loss of traditional habitat, but seem to be doing well in suburban situations with ample nesting sites and bird feeders (*R. Mirarchi*).



Top and above: The beaver is widespread today. Its capability to flood forests and crop fields often puts it at odds with man and his land use objectives (*J. Dickson, Outdoor Oklahoma*).



Ruffed grouse populations in the southern Appalachians appear to have dwindled due to the loss of early successional habitat (*Ruffed Grouse Society*).

The northern bobwhite was once a very popular game bird in the South. But as small weedy fields disappeared and southern forests aged the call of the bobwhite has become increasingly rare (*J. MacHudspeth*).



Several species and groups of southern wildlife are the focus of special interest.



Red-cockaded woodpecker populations declined as old-growth pine stands were harvested. Now there are substantial efforts, particularly on federal land, in behalf of this species (*P. Moore, OK Dep. Wildlife*).



Population viability of some forest interior species may be negatively impacted by forest fragmentation (*M. Hopiak, Cornell Lab of Ornithology*).



Sandhill crane chick and egg. There is some concern for a few species of birds such as the sandhill crane (*D. Hancock*).



We don't know very much about the life history or habitat requirements of some vertebrates, such as bats, reptiles, and amphibians. The Rafinesque's big-eared bat shown here is a species of special concern. Originally it hibernated and reproduced in large cavity trees. Now it uses man-made structures such as buildings and wells (*D. Saugey*).

Wildlife foods



Oak acorns wherever they occur are a principle food in fall and winter for a number of wildlife species. Parent nutrition, and production and survival of young often depend on the previous season's acorns. However annual production is very erratic (*US Forest Service*).



Fruits from shrubs are important wildlife food for a number of species in summer and fall (*US Forest Service, H. Holbrook, J. Dickson*).



During spring and summer insects are primary food for a wide variety of adult and young game and nongame birds (*J. Dickson*).





Protection and particular management is needed for some sensitive plant species and communities. Coastal plain bogs and seasonally wet longleaf pine flatwoods are among the most diverse communities in the world, supporting many different plants, *top*. Among the plants of interest found here are a variety of orchids, such as this rosebud orchid, *left* (J. Walker).



Big-leaf geranium, *above*. The rich cove forests of the southern Appalachians are renown for displays of spring wild flowers. Many are ephemeral, growing and flowering each season before the canopy leaves out (J. Walker).



The nature of the South's people and their relationship with the forest continue to change. One of the biggest challenges will be to manage for varied products, while protecting and allowing use of southern forests. It is important to help an increasingly urban population understand natural resources and their management (K. Cordell, S. Thompkins, M. Staten).

Smokehouses to cure pork were a common feature of early rural southern settlements. Many of these swine drifted away from the farms and eventually became feral, or wild-living (Towne and Wentworth 1950, Hanson and Karstad 1959, Mayer and Brisbin 1991). Free-ranging domestic hogs in the South were widespread in the early 1900s. But with the increasing human population in the region, open range was largely eliminated in the mid 1900s when most southern states legislated closed range laws (Mayer and Brisbin 1991).

Eurasian wild boar were introduced in the South in the early 1900s to provide new huntable big game animals. The earliest documented introduction of wild boar was into a fenced shooting preserve located on Hooper Bald, Graham County, North Carolina in 1912. Following a period of about 10 years of confinement, these animals escaped during a large-scale hunt. The wild boar dispersed into the surrounding mountainous terrain and over time interbred with local feral hogs. Hybrid stock from this area have either spread or were live-trapped and relocated into portions of California, Texas, Georgia, Florida, Kentucky, North Carolina, South Carolina, and Tennessee (Mayer and Brisbin 1991).

Additional stockings of hybrid animals of unknown origin have reportedly taken place in Arkansas,

Mississippi, and Louisiana. Although prohibited by both federal and state regulations, the additional introduction or release of feral hogs and hybrids continues in many areas of the South today (Mayer and Brisbin 1991). Also, wild hogs have been introduced and populations have become established in numerous areas across the central United States.

Wild hogs currently are found in scattered populations and varying densities in all of the southern states. Most populations are found in the Coastal Plain region, however, substantial populations are also found in some portions of the Appalachian Mountains. They are widespread in eastern Texas, Louisiana, and Florida. The current regional population estimate for this species in the southern United States is between 1 and 2 million animals (Mayer and Brisbin 1991, Miller 1993).

HABITAT

Throughout the southern states, wild hogs use a variety of habitat types. The most commonly used habitat in the South is riparian forest associated with a year-round water source (Sweeney and Sweeney 1982). However, the types of habitats successfully occupied by this species range from the mountainous hardwood forests of the southern Appalachians; to the bottomland forests



With adequate nutrition sows are very prolific, producing several litters each year (J. Mayer).

along rivers in South Carolina, Georgia, and eastern Texas; to the marshy palmetto and oak flats of central and south Florida, (Mayer and Brisbin 1991).

The general habitat requirements for this species include a mast-producing cover type during the fall and winter months, and both well-distributed water and escape cover on a year-round basis (USDA 1981). Both hard and soft mast play an important role in the nutritional status and reproductive biology of this introduced species. The importance of hardwoods, particularly oaks, to wild hogs is evident wherever these animals are found. For example, in the Appalachians Eurasian wild hogs used mixed oak stands during fall and winter of years of high mast production, but used other hardwood stands when little mast was available (Singer et al. 1981).

Wild hogs are found only in areas that are associated with either permanent drainages or widespread mesic habitats. The absence of water in an area will effectively preclude establishment of this species. Habitat use by wild hogs is related to cover density (Barrett 1978). Cover habitat also functions as a preferred bedding location for this species. In cooler weather wild hogs usually make beds where they will get warmth from the morning sun. In the southern Appalachians, most beds are found on slopes or areas with a south, east, or south-eastern exposure. In addition, dense cover affords wild hogs some measure of protection from hunting (Conley et al. 1972).

Seasonal changes in habitat use are related to food availability and dietary shifts (Sweeney 1970, Kurz and Marchinton 1972, Graves and Graves 1977). For example in South Carolina, an abundant mast crop in the fall concentrated feral hog activity in bottomland hardwoods, but they moved to upland pine plantations around thickets of ripe plums during summer (Kurz and Marchinton 1972).

Movements of wild hogs are variable and dependent, to some extent, on food availability and sexual activity. In general, males travel more than females, and sexually active males traveled more than sexually inactive males. Also, movements were least during years and season of high acorn production; hogs moved more to find food during periods of food shortage (Singer et al. 1981).

REPRODUCTION

Compared to all other native or introduced big game species found in North America, wild hogs have the highest reproductive potential. This species sexually

matures at an early age, produces the largest litters of any ungulate, can farrow 2 litters within a twelve-month period, and breeds throughout the year. Reproductive success in wild hog populations depends on food availability, particularly the annual mast crop (Matschke 1964, Scott and Pelton 1975).

Sexual maturity in wild hogs can be reached as young as 5 months in males and 6 months in females. Excluding unusual circumstances or pathological conditions, all individuals of both sexes become sexually mature before the end of the first year of life (Sweeney 1970, Barrett 1978). Wild hogs in the South are sexually active and will breed throughout the year. Although variable by area, there are usually 2 peaks in the annual reproduction among wild hogs, a major one in late fall to early winter and one in late spring to early summer (Sweeney 1970, Conley et al. 1972, Johnson et al. 1982).

The gestation period of wild hogs ranges from 110 to 140 days, with an average of 114-116. Estrous cycles are resumed and sows may breed soon after their young are weaned at about 3 to 5 months of age (Asdell 1964, Barrett 1978).

The fetal litter size in wild hogs varies from 1 to 16, with a mean of between 5 and 6. The observed intrauterine mortality varies from 23-40 % (Asdell 1964, Baber and Coblenz 1986, Hellgren 1993).

The pregnant sow builds a farrowing nest approximately 2 to 3 days before giving birth. These nests tend to be shallow depressions lined with grasses, leaves or other plant material. After the litter of piglets is born, the young stay in or near the nest for about a week, even while their dam leaves to forage. The basic social group among wild hogs is a sow with her offspring; mature boars are usually solitary except when breeding. Juvenile mortality in wild hogs can be high, with observations varying from 9 to over 90 % in any given year (Crouch 1983, Barrett 1978).

FOODS

Wild hogs are both omnivorous and opportunistic in their dietary preferences (Sweeney and Sweeney 1982). In general, however, most recent studies have shown that wild hogs consume far more plant than animal material on an annual basis. The specific diet of a wild hog population is largely dependent upon what foods are available in a local area at any one time of the year (Barrett 1978, Belden and Frankenberger 1990), and can change as new forage species become available.

The list of plant material eaten by wild hogs includes a wide variety of both above and below ground stems, leaves, fruits, roots/tubers, forbs, fungi, and woody vegetation. Hard mast such as acorns and hickory nuts is important and preferred food when it is available (Henry and Conley 1972, Scott and Pelton 1975, Matschke 1964). In general, wild hogs feed on grasses and forbs in the spring, fruits in summer and fall, and roots and tubers throughout the year (Hellgren 1993). The opportunistic food habits of this introduced species also often result in the depredation of a variety of commercial grain and vegetable crops.

Although typically low in volume and frequency (both less than 10%), the consistent use of and apparent determined searching for high protein animal food resources may indicate the importance of this component within the diet of wild hogs (Barrett 1978, Scott and Pelton 1975). On islands where food resources are more limited, the seasonal volume of animal material in wild hog diets has been documented to be as high as 26% (Baron 1979). Wild hogs eat a variety of animal matter, such as insects, crustaceans, mollusks, worms, fish, amphibians, reptiles, birds, and mammals. This component of the wild hog's diet includes consumption of both predated animals and carrion that is found. Eggs of a number of vertebrate species are also consumed opportunistically.

Wild hogs feed mostly at night, but also may feed during daylight hours. For example, in the Appalachians radio-instrumented Eurasian wild hogs were more active during twilight and at night than during the day in all seasons (Singer et al. 1981).

DISEASES AND PARASITES

Wild hogs are susceptible to a wide range of diseases and parasites. Some of these diseases are specific to swine, while others are shared by other wild and domestic mammals as well as by man. In general, wild hogs have the potential to contract and transmit all of the viral, bacterial, and fungal diseases of domestic swine (Payeur 1989). In some cases, wild hogs may carry and be resistant to diseases, but are capable of infecting domestic livestock, native game species such as white-tailed deer, or hunters. For this reason there is concern over the potential of wild hogs functioning as disease reservoirs in areas where they are abundant (Nettles 1989, Davis 1993).

The list of diseases which can infect wild hogs includes but is not limited to the following: psuedorabies, hog cholera, swine brucellosis, bovine tuberculo-

sis, vesicular stomatitis, vesicular exanthema, trichinosis, foot-and-mouth disease, African swine fever, leptospirosis, bubonic plague, anthrax, transmissible gastroenteritis, rinderpest, porcine encephalomyelitis, porcine enterovirus, reovirus, swine influenza, and Venezuelan equine encephalitis (Davis 1993, Mebus 1989, Nettles 1989). Of particular concern are swine brucellosis and psuedorabies because these diseases are a threat to the domestic swine industry and are subjects of major control programs by both federal and state agricultural agencies.

Brucellosis is an infectious bacterial disease of animals and humans caused by members of the genus *Brucella*. The effects of this disease are generally limited to abortions and reproductive organ infections. In humans brucellosis may clinically mimic severe flu and may resemble crippling arthritis or meningitis. There is no cure for brucellosis in either animals or humans (Davis 1993). The occurrence of brucellosis infections in wild hogs in the South has been found to vary from 6 to 53% of animals tested (Becker et al. 1978, Zygmunt et al. 1982). The areas of highest brucellosis incidence in the South have been in Florida (Becker et al. 1978). Bigler et al. (1977) reported that 22% of human cases of brucellosis in Florida were attributable to hunter contact with wild hogs.

Psuedorabies is an infectious, alphaherpes viral disease of the central nervous system in wild hogs that is also found in domestic livestock, cats and dogs (Davis 1993). Transmission is through animal to animal contact or contact with contaminated media such as food and water. Most swine remain latently infected following clinical recovery. Except for swine, the disease is almost always fatal (Payeur 1989). Small pigs are more severely affected, but more virulent strains have recently developed and fatalities among adult swine have been observed (Davis 1993).

A variety of parasites infect wild hogs, but typically do not cause direct mortality. Endoparasites that appear to be well-established in wild hog populations include lungworms, kidney worms, liver flukes, thorny-headed worms, stomach worms, intestinal round worms, hookworms, nodular worms, coccidia (*Sarcocystis* spp.) and threadworms (Smith 1981, Nettles 1989). Kidney worms and lung worms are known to cause severe debilitation in domestic swine; and in conjunction with other unfavorable conditions could represent significant morbidity/mortality factors to wild hogs (Smith 1981). Dog ticks, hog lice, and mites (*Sarcoptes scabiei*) are the most typical ectoparasites found on wild hogs. With the exception of sarcop-



Wild hog rootings are a problem in disrupting plant communities (*J. Mayer*).

tic mange, none of these ectoparasites constitutes a public health threat (Smith 1981).

INTERACTIONS

Although considered beneficial in some areas, abundant wild hogs usually are regarded as a significant liability (Lucas 1977, Tisdell 1982). Federal and state agricultural and environmental agencies and interest groups consider wild hogs to be serious economic pests and an undesirable exotic species that causes ecological damage.

In this species sebaceous glands do not function as sweat glands, so hogs cannot cool themselves physiologically. Therefore wild hogs need to wallow throughout the year, especially during hot weather. Wallowing serves to reduce their body temperature and provides a protective coating of mud that functions to either exclude or immobilize ectoparasites. Wild hog wallows can be found in almost any type of low-lying, wet area, and can be found in either isolated sites or in association

with bottomland drainages and streams (Conley et al. 1972, Belden and Pelton 1975). Wallowing can degrade water quality of riparian streams. In the Appalachians, siltation and contamination of streams from rooting and wallowing are suspected of being detrimental to the native brook trout populations (Howe et al. 1981).

Another common activity of wild hogs is rubbing. This behavior involves an animal rubbing or scratching against a tree trunk, post, or other stable vertical structure. Rubs appear to provide comfort, remove excess mud obtained during wallowing, and to mechanically rid the body of ectoparasites. However, not all rubbing is associated with mud wallows. Wild hogs also will rub against pines and creosoted telephone poles, whose pine resin or creosote seems to serve as a repellent for lice and ticks.

Rooting is the most obvious and widespread damage caused by wild hogs in areas where these animals occur. Hog rooting is most often observed in the winter and early spring months when other food resources are not plentiful (Baron 1979). The location of wild hog

rooting in different habitat types appears to be related to seasonal movement, food availability, and reproductive activities (Belden and Pelton 1975). Excessive hog rooting can destabilize surface soils and increase soil erosion that can be particularly damaging to stream channels, roads, rail beds (Lucas 1977). Singer et al. (1982) found that rooting mixed the top two soil horizons and reduced ground vegetative cover and leaf litter. In some areas, the entire herb understory was removed by rooting activity (Bratton 1977). Rooting has also been shown to damage tree roots and increase the amount of sprouting and root suckers (Huff 1977). Although claimed by some to benefit in forest regeneration, disturbances caused by rooting may enable the establishment of undesirable weed species in some areas. Extreme rooting by wild hogs can also influence nutrient cycling within the forest floor (Lacki and Lancia 1983).

Wild hogs may negatively affect native plant communities (Wood and Barrett 1979), from both rooting and direct foraging. These animals have been an especially difficult problem with respect to protecting fragile plant communities in high elevation ecosystems in the Great Smoky Mountains National Park. Wild hog rooting reduces ground cover and negatively affects some sensitive herbaceous species. Within the park, over 50 non-woody species are known to be eaten, uprooted, or trampled. Hog activities change plant species composition in favor of plants with deep or poisonous roots (Bratton 1977). In contrast to other studies, Baron (1982) concluded that the feral hog rooting and foraging did not disrupt a barrier island's plant communities.

Wild hogs have long been known for their depredations to both agricultural crops and forest plantations. The list of crops impacted by foraging wild hogs includes corn, milo, rice, watermelons, peanuts, hay, turf, wheat and other grains. Wild hog-caused damage to these crops results from feeding and related trampling and rooting. Wild hogs on national wildlife refuges also damage crops specifically planted for waterfowl (Thompson 1977). Wild hogs have been a problem in their damage to pines (Wakely 1954). They root up and chew the roots of planted loblolly and slash pine seedlings, sometimes destroying entire pine regeneration areas (Lucas 1977). Wild hogs also feed on the grass stage of longleaf pine, and chew on the lateral roots of mature pines (Conley et al. 1972, Lucas 1977). They also root up and consume newly-planted cherrybark and swamp chestnut oak seedlings, and probably other hardwoods where available.

A number of vertebrate species are preyed on by the omnivorous wild hog. Typically this predation is directed at young animals and less mobile species, but the effects on populations are unknown (Wood and Barrett 1979). Adult hogs can also be effective predators of both domestic livestock and ungulate game species. While hogs will readily prey on healthy newborn lambs, kids, calves, and fawns, it should also be noted that wild hogs will also attack, kill, and eat adult sheep and goats (Beach 1993). Wild hogs also opportunistically prey on the eggs of ground-nesting bird species, such as the ruffed grouse, wild turkey, and northern bobwhite (Conley et al. 1972, Hanson and Karstad 1959, Stegeman 1938), particularly where wild hog densities are high (Henry 1969, Matchske 1965). Recent observations in eastern Texas suggest that high densities of hogs may preclude wild turkey nesting success (J. Burk: pers. comm.). Wild hogs inhabiting the coastal barrier islands of the southeastern United States have also been found to be a significant predator of both the eggs and hatchlings of loggerhead and green sea turtles (Hanson and Karstad 1959, Thompson 1977, Baron 1982, Mayer and Brisbin 1995).

Although man is the most significant predator of wild hogs in the United States (Sweeney and Sweeney 1982), other species of wildlife prey on wild hogs. Documented predators of wild hogs include black bear and cougar for all age classes, and coyote and bobcat for immature individuals (Stegeman 1938, Young 1958, Conley et al. 1972). American alligators will also opportunistically prey on wild hogs (Shoop and Ruckdeschel 1990).

One of the concerns about the introduced species has been competition with native species for available food, particularly mast. Acorns are a primary diet item of wild hogs as well as several species of native southern wildlife, such as white-tailed deer, black bear, gray and fox squirrels, wild turkeys, and woodrats. Studies have shown annual acorn production is highly variable and in some years is very low. It has been demonstrated that low acorn production can negatively affect deer overwinter survival and subsequent fawn survival (Rogers et al. 1990); and other species are probably negatively affected as well. During these years of minimal acorn production, wild hog consumption of acorns probably negatively affects mast-consuming species in oak forests.

A general dietary overlap also suggests some competition between wild hogs and other species, such as range cattle, striped skunks, common opossums, red and gray foxes, raccoons, bobcats, muskrats, nutria,

eastern cottontails, swamp rabbits, hawks, owls, and waterfowl (Conley et al. 1972, Bratton 1974, Thompson 1977, Baron 1979).

CONTROL

Because wild hogs are very prolific and become wary with hunting pressure, once populations are established they usually are difficult to control. To be effective, control efforts must be intensive and continuous (Wood et al. 1992). Control techniques include fencing, snares, trapping, shooting, and hunting with trained dogs. Although inexpensive and widely used in Australia (Hone and Pedersen 1980), poisons or toxicants such as Compound 1080 or Warfarin for controlling wild hogs have not been approved for use in the United States (Littauer 1993).

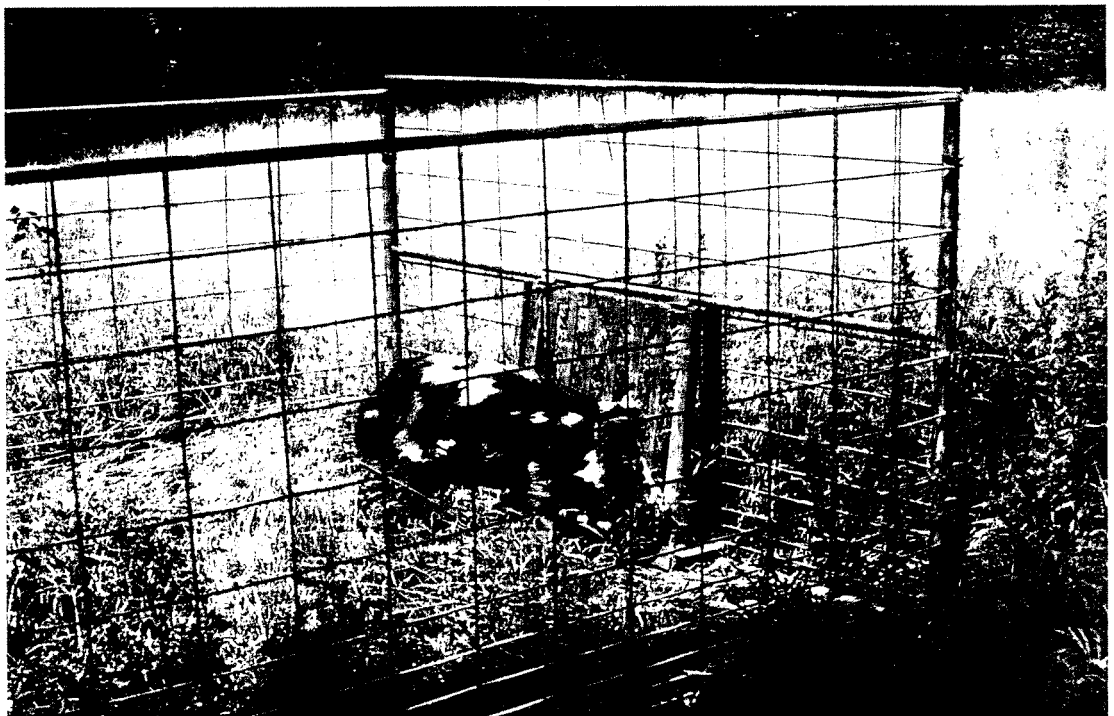
A variety of fence designs have been described for restricting wild hog access into crop fields and lambing pastures (Littauer 1993). Electric fence designs in Australia have been shown to exclude hogs 94% of the time (Hone and Atkinson 1983). Nonelectric fence must be of net wire or diamond mesh construction with a spacing of vertical wires of 6 inches or less to be hog proof (Hone and Atkinson 1983, Littauer 1993). In addition, these fences must be at least 3 feet tall and buried beneath the ground at the bottom to be effective (Littauer 1993). However, hog-proof fencing is difficult to erect

and maintain in uneven terrain (Littauer 1993), and generally, is not economically feasible in most situations.

The use of snares can be effective in controlling wild hogs. For example, in the last decade over half of the wild hogs removed by the Texas Animal Damage Control Service were accounted for by the use of snares. Snares consist of a loop of steel cable that is attached to a secure object so that the loop catches the hog as it passes through a small area or opening. Snares for taking wild hogs are typically placed over holes in fences that hogs have been using (Littauer 1993). Although of relatively low cost compared to other control methods, snaring has several disadvantages including the ability to capture only one animal at a time, being inappropriate to use in some situations, the ability of very large hogs to occasionally break snares and escape, and the capture of nontarget species (Littauer 1993). In addition, the use of snares for controlling wild hogs in some areas has met with public opposition (Anderson and Stone 1993).

Large cage or pen/corral traps can be a very effective method for controlling wild hogs. Traps are available or can be constructed in a variety of designs. Some designs are made of takedown panels that are easily moved and set up. Trapping is usually more effective during winter when food is in short supply, and before spring green vegetation is available. Corn is one of the most common baits used for trapping wild hogs; soured

Controlling hog populations is a frequent problem; one method is trapping (J. Mayer).





Hunting wild hogs with dogs is a popular activity and can be an effective control method (*J. Mayer*).

or mash corn has been found to be especially attractive to hogs. The primary advantage of using traps is that more than one hog can be captured at a time (Belden and Frankenberger 1977, Littauer 1993). The drawbacks of using traps are: traps are cumbersome, require some effort to set up, hogs can become trap shy, and trapping generally is less effective during summer months when there usually is ample food (Littauer 1993).

Shooting wild hogs can be a very useful control method. This method can be carried out through pedestrian, vehicular or aerial means, and typically uses either a high-powered rifle or shotgun. Opportunistic shooting of hogs on the ground is less expensive than most other means of control, but it is typically less successful in removing large numbers of animals (Fox and Pelton 1977). In some situations large numbers of hogs can be removed through aerial shooting from a fixed wing aircraft or helicopter, but it is expensive (Littauer 1993). The primary advantage of shooting is the ability to select specific target animals for removal. Disadvantages of shooting include both a potential for wounding animals and safety concerns associated with the discharging of firearms in some areas.

The use of experienced hog dogs for removing wild hogs is an age-old technique that is still very effective. This control method also allows the hunter the option of selecting individual animals, and of killing or carrying captured hogs out alive. An advantage of using trained dogs is that many hogs can be taken in a relatively short time. However, experienced hog dogs are very expensive and dog casualties from hunting hogs may be high (Littauer 1993).

HUNTING

Wild hog hunting is a popular pastime in many areas of the South. In some states (North Carolina, Tennessee, and West Virginia), they are considered game animals with associated seasons and bag limits. However, in most other states they can be hunted at all times of the year on private land and can be taken in ways that are illegal for game animals (Mayer and Brisbin 1991). Wild hogs can be located by scouting for rootings, tracks, rubs, wallows, and scat. If not limited by state regulations, wild hogs may be still-hunted, stalked, hunted over bait such as corn, and hunted at night with lights.



Wild hogs can be located by wallows in the ground or rubs on trees (J. Mayer).

A popular form of hunting in the South is with hog dogs. It is an exciting activity and has a dedicated following. Dogs, such as Catahoulas or blackmouth curs, can function as both trail and bay dogs. Other breeds of dogs, such as pit bulls or pit bull/cur crosses, are used to catch and hold the hogs. Hogs are killed or caught, thrown and tied up after they have been bayed. Captured hogs often are held in pens to be fattened for later consumption. In hunting wild hogs with dogs, a variety of weapons are employed, including guns, bows, knives, and even spears.

In still hunting, standard centerfire rifle calibers of .243 or larger that are adequate for deer are normally used. Shotguns loaded with either buckshot or slugs may also be used for both still and drive hunts. Because wild hogs are often easier to stalk than white-tailed

deer, many hunters in the South hunt hogs with either handguns or archery gear. Hog hide and the subcutaneous gristle pad on the shoulders and upper sides of mature boars are thick and can be difficult to penetrate.

Care should be taken when dressing wild hogs to avoid infection with swine brucellosis. It is advisable to wear disposable plastic or rubber gloves, to avoid direct contact with blood or reproductive organs (especially the uterus and uterine fluid from mature sows), and to wash hands thoroughly when completed.

Feral hogs are very good to eat. The meat is tasty and has more natural fat than native game animals, such as deer, but normally is not as fatty as domestic hogs. Care should be taken to fully cook the meat to kill any possible pathogens.

CONCLUSION

Because of their trophy and table qualities, wild hogs have been introduced throughout much of the South. But there are substantial problems associated with these animals. Wild hogs may negatively impact natural ecosystems and vegetation. They compete with native species for food when these forage resources are in limited supply. They harbor diseases, which may be a threat to both man and domestic livestock. They are a problem in a variety of land management activities. Populations of wild hogs are very difficult to control once they are established. Because of these problems, it is recommended not to introduce wild hogs into new areas, and to control populations where they and related problems are excessive.